

200

UNIVERSITY OF CALIFORNIA
MUSEUM OF VERTEBRATE ZOOLOGY



Digitized by the Internet Archive
in 2017 with funding from
CLIR

<https://archive.org/details/fieldnotesv156000rich>

200
Richardson, F.
Southeastern Oregon
1937

(Order as arranged and indexed
by Richardson - see first page)

and Richardson 1937

Southeastern Oregon Field-notes

May 25, 1937 - June 22, 1937

(In company with Dr. Allen H. Miller and Joe T. Marshall, Jr.)

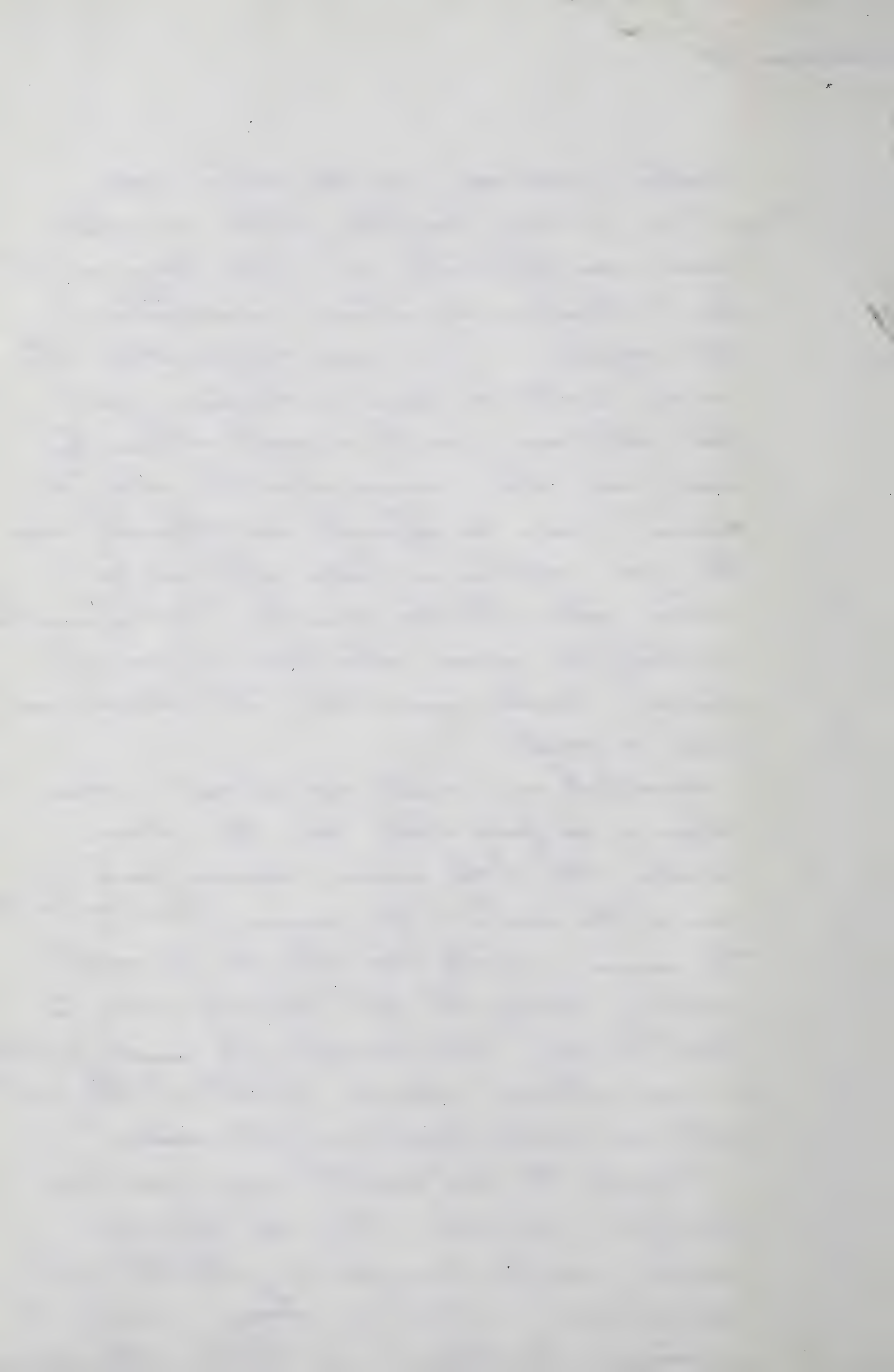
Contents

<u>Location or Material</u>	<u>Pagination</u>
General Comment and Bird-list	1-32
Mouth 20 mi. E., 9 mi. S Adel, Lake Co.	1-9
SE end Warner Valley, Lake Co.	10-11
Barley Camp, Warner Mts., Lake Co.	11-15
Plush, Lake Co.	16-18
Fort Warner, Hart Mts., Lake Co.	19
N base Crook Pk., Warner Mts., Lake Co.	20-22
1 mi. S East Lake, Paulina Mts., Deschutes Co.	23-25
3 mi. W Paulina Lake, Deschutes Co.	26-32
Mammal Species-notes	33-34
Bird Species-notes	35-59
Catalogue of all specimens	60-67

Mouth of 20-mile Creek, 9 mi. S Adel, Lake Co., Oregon
May 25, 1937 - A brief description of the immediate region were appropriate now - today being our first day of collecting and intensive investigation of this country. - The main Warner Valley, into which 20-mile Creek opens, is extensive, quite flat, with larger growth as small willows typically only where canyons enter the valley. The amount of rain has apparently been exceptionally large this year resulting in large expanses of shallow water with tules, grasses etc. This has provided a habitat for various water birds. (Only cursorily observed. Shovelers, Cinnamon Teal, Coots, Mallards - seen paired for example.)

20-mile Creek runs about east and west; volcanic ridges go up fairly steeply from the stream on either side of the canyon, becoming fairly high even at the mouth of the canyon. (from 300-700 ft.) The canyon is fairly flat towards its mouth, widening during its last half-mile or so, to about $\frac{1}{4}$ mile. This has apparently made possible a more extensive riparian habitat at this part with more willow thicket and open meadow.

Briefly, the chief habitats so far encountered have been - riparian, willow and cottonwood; meadow, marshy, low woods or cultivated field; high chaparral, on land near stream, grading into riparian; low chaparral, on hillside, rather sparse



F. T. Richardson 1937

20-mile Creek May 25 cont.

and of bushes averaging say $2\frac{1}{2}'$. Both these chaparral habitats are, tentatively, of one same dominant sagebrush (?). The high type is larger and varied with several other bushes, probably because of more water. The low, hillside type is almost without exception of this sagebrush only. The bushes are low and rather definitely and regularly spaced - probably an indication of lack of much available water. Occasional junipers are growing on the hillside, becoming more abundant higher up.

The abundance of birds here is at once apparent. That this abundance seems concentrated around the floor of the canyon, especially its mouth - seems true for several reasons. Water is here most plentiful, vegetation most varied and luxuriant, civilization present, and insects more abundant and varied. Careful observation of birds on the canyon sides shows a lesser abundance in numbers and species; Rock-wrens and Towhees, for example, being present in small numbers. (The rocky habitat should have been included in the above habitat discussion, for it becomes most prominent, especially higher up the canyon sides.)

F. T. Richardson 1937

20 mile Creek May 25 cont.

Birds Identified, with General Abundance			
✓ Red-shafted Flicker	2	Audubon Warbler	1
Mourning Dove	v. com.	✓ Yellow-throat	v. com.
Sparrow Hawk	2	✓ Lazuli Bunting	v. com.
Red-tailed Hawk	1	✓ House Wren	1
Marsh Hawk	2	Rock Wren	v. com.
✓ Long-eared Owl	2	✓ Black-headed Grosbeak	1
✓ Magpie (Black-billed)	v. com.	✓ Lark Sparrow	v. com.
✓ California Jay	com.	✓ Brewer Sparrow	com.
Western Crow	com.	+ Western Robin	com.
Black-crowned Night Heron	1	Western Bluebird	uncom.
✓ Brewer Blackbird	v. com.	Mountain Bluebird	uncom.
✓ Bullock Oriole	2	✓ Western Tanager	com.
Red-winged Blackbird	com.	✓ Poorwill	com.
✓ Cuckoo		Western Meadowlark	com.
Violet-green Swallow	com.	✓ Song Sparrow	com.
✓ Rough-winged Swallow	uncom.	Golden Eagle	2
✓ Cliff Swallow	uncom.	Turkey Vulture	9
Barn Swallow	com.	Spotted Sandpiper	uncom.
Wood Pewee	1		
Western Flycatcher	1	N.B. (See additions on pp. 5, 6 + 8)	
✓ Empidonax sp.	1		
Ash-throated Flycatcher	v. com.		
Black Phoebe	1		
✓ Warbling Vireo	com.		
Pileolated Warbler	1		
✓ Yellow Warbler	3		

✓ = collected (by any of us)

v. com. = very common

com. = common

uncom. = uncommon

F. Richardson 1937

4.

Mouth of 20-mile Creek, 9 mi. S Adel, Lake Co., Oregon
May 26, 1937 - On this, the second day of collecting,
observation and collecting was done farther
from the immediate mouth of the canyon.
Two of us went up above the east ridge of the
canyon to something of a sagebrush covered
mesa. Our third member went fairly high up the
west side of the canyon - high enough to get
into numerous small junipers. These extensions
of habitats studied were of interest in com-
parison to the lower habitats already studied.
On the sagebrush mesa (low sagebrush of
predominately one species [see pp. 142]) Brewer Sparrows
were decidedly abundant. Dr. Miller collected
several vesper Sparrows and a Sage Sparrow - neither
of which have been seen lower down, although
the couple hundred feet of higher altitude give
rise to little difference in vegetation.

Some observations were made in regions of red
or dark lava boulders. Rock Wrens were the
most abundant and almost the only bird here
associated. However the Rock Wrens seem pale
to me and their association with dark lava
might tend to disprove their possible protect-
ive coloration. A single lizard was seen
(will be collected, if possible, in future) on the
dark and red rocks. It was definitely red
or reddish coloration. This protective coloration,

20-mile Creek May 26 cont.

if it proves of interest by being verified, would be of interest compared to the Rock Wren. It might indicate the more sedentary habit of the lizard and a closer association with the red lava.

The juniper habitat was not personally studied except in the few isolated trees growing on the east wall of the canyon. A flicker was collected and two others observed near juniper groves on the west wall. The one collected was filled to repletion with ants. Several flickers have been seen in the floor of the canyon but may it be that ants or certain ants are associated with junipers? Western Tanagers seemed to show a preference for junipers - perhaps recalling their more typical (?) higher life zone nesting. Perhaps a food relation? A pair of Golden-mantled Ground Squirrels also were seen only in the vicinity of rocks by junipers. How is this comparable to the tanagers?

Additions to Birds Identified (see p. 3) -

- ✓ Brewer Sparrow
- ✓ vesper Sparrow
- ✓ Sage Sparrow
- ✓ Green-tailed Towhee
- Prairie Falcon
- Horned Owl

Richardson 1937

Mouth of 20-mile Creek, 9 mi. S Adel, Lake Co., Oregon

May 27, 1937 - The morning, from 4 - 8:30 A.M. was spent in observing and collecting birds in the extensive area of high sagebrush (dominant) at the broad mouth of the canyon, perhaps best considered part of Warner Valley proper. That this is a definite habitat for certain species is attested by the finding here of birds not seen in other regions (as bush-tits, Chipping Sparrow, Mallards (nesting)). It seems to approach the ideal habitat for other species (as quail, yellow-throats, chats, Squab Bantings) which are here very common while less common or rare in habitats in the canyon itself.

Data on breeding birds may be summarized:
 Becoming paired: Mourning Dove,
 Building nests: Brewer Sparrow, Yellow-throat, Robin
 With eggs: Mallard, Calif. Jay, Calif. Quail, Brewer Blackbird
 With young: Long-eared Owl, House Wren

Additions to Birds Identified (see p. 3)

✓ Chipping Sparrow

Linnet

Pentast Dusk

✓ Long-tailed Chat

Shoveler Dusk

Towhee Warbler

a white-crowned Sparrow

✓ Plumbeous Bush-tit

✓ Steller Jay

✓ Titmouse

Richardson 1937

Mouth 20-mile Creek, 9 mi. S Adel, Lake Co., Oregon
May 28, 1937 - Collecting and observing were done
this morning principally on the upper west
ridge of 20-mile Creek, in the junipers. These
junipers are typically small trees, 15-25', but
are occasionally up to 40'; apparently where a
little more water is available. An actual
forest is not formed for junipers are well
separated from each other with brush in
between.

Animal associations with the junipers have
been noted. Vireos seem limited to them,
as do Black-Throated Gray Warblers, Stellar Jays (!).
A large chipmunk was seen under junipers. A
porcupine was seen in a juniper and probably
this species has a food relation with the juniper,
this being the only abundant tree in these
regions. The "berries" of the juniper might serve
as animal food. Their outer layer is sweetish
and not unpleasant to the taste.

Cattle have wandered and fed over most
of the slopes seen. Just what effect this
has had on birds or mammals is unknown.
Probably the effect has not been great as
there seems to be little low annual forage
for cattle and no birds present which are
typically ground or meadow dwellers.

Richardson 1937

Mouth 20-mile Creek, 9 mi. S Astor, Lake Co., Oregon

May 29, 1937 - The day was again spent (5-9 A.M.) in the flat area of high sagebrush with occasional thickets of willows gooseberry (?) and wild rose (?). These thickets are a distinct habitat in themselves; for example the yellowthroats are typically confined to them as are the Song Sparrows, Chats, and several warblers. The willow thickets are usually associated with running water while the other thickets may seem to be purely "islands" in the general sagebrush habitat.

The abundance of birds in the whole region of 20-mile Cr. may be explained on the basis of number of habitats. Mountains, canyon and valley with varying soil and water conditions, combine to make a large number of habitats possible. The effect of altitude (probably around 4,000') is problematical here and must be considered in the light of the climatic factors.

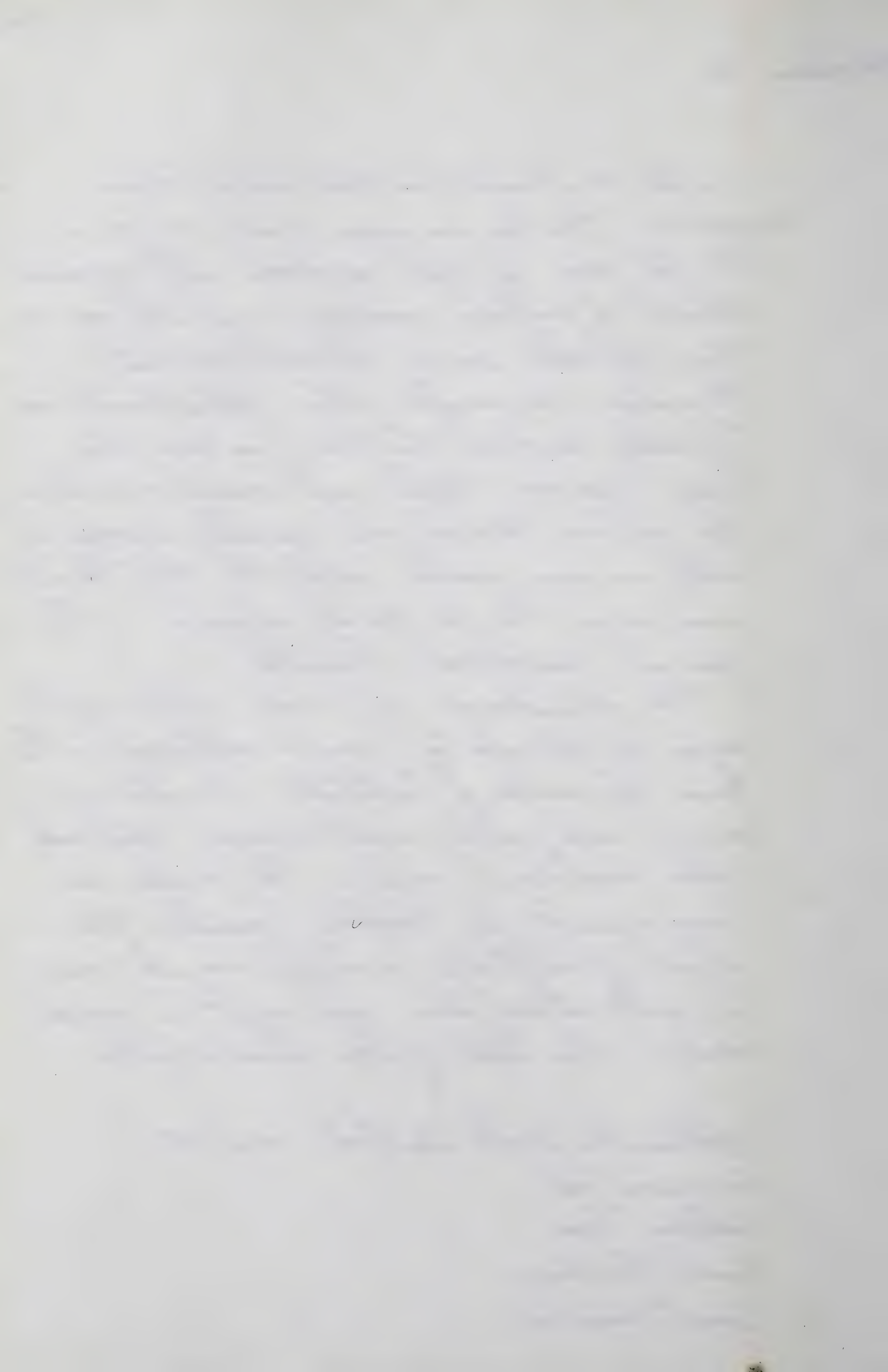
Additions to Birds Identified (see p. 3 etc.)

Cinnamon Teal

Caspian Tern

Great Blue Heron

Sage Thrasher



Richardson 1937

Mouth 20-mile Creek, 9 mi. S Adel, Warner Valley, Oregon
 May 31, 1937 - Collecting and observation were
 carried on in the area of high sagebrush
 at the broad mouth of the canyon and
 also in the canyon proper. The weather
 was clear and hot today in contrast to
 wind yesterday. On such a hot day the
 birds seem to become quiet vocally and
 actively, quite early - say by 8 or 9 A.M. This has
 seemed particularly true of the juniper
 habitat perhaps because there is a more definite
 association of birds with habitat here, and fewer
 birds.

Bailey's life-zone map of Oregon would make
 this region (Warner Valley) Upper Sonoran. This
 is probably correct in part if the predominant
Artemisia and *Lepidopartum* (?) may be taken
 as indicators, especially as they are high (up to
 8' in places). However, this seems to be a
 higher "type" of Upper Sonoran than that around
 Berkeley, Claremont etc. - higher in the life-zone
 series. This seems true as indicated by extremes
 of temperature (snow even falling at end of May)
 and a comparatively late breeding season.

Richardson 1937

10.

SE End Warner Valley, Lake Co., Oregon

June 1, 1937 - A trip was taken this morning around the edge of the end of the valley. Of primary interest was a region of shallow lakes, grassy meadow, marsh and tules. Though large areas of Warner Valley are now of this type, the small region studied is probably a fair index of birds in other parts. Following is a list of the birds seen - breeding birds almost without exception:

Sandhill Crane (1 seen, others heard in distance)

Bittern

Red-head Duck

Killdeer

Willet, Western

Avocet, American

Shoveler Duck

Canada Goose

Mallard Duck

Pintail Duck

Cinnamon Teal

Caspian Tern

Forsters Tern

California Gull

Marsh Hawk

Coot

Yellow Headed Blackbird

Grasshopper Sparrow

Wilson Phalarope

SE End Warner Valley June 1, 1937 (cont.)

Residents say that this is an exceptional year in having much water in Warner Valley. As it is it seems to be an ideal breeding territory for ducks, geese, cranes etc. The abundant water may well have made possible the great number and variety of passerines etc. with increased vegetation and insect life. If numerous water birds have not been able to breed here in previous years, the above may be evidence of their quickness to take advantage of conditions approaching optimum, rather than trying to breed in the same region every year.

A line of 30 mouse traps was set out last night in a sagebrush region just east of the mouth of 20 mile Cr., next to the hills. Soil - rather hard - a bit sandier on the flatter ground and next to the rocks - in which places burrows were more in evidence. Caught 7 mice - *Peromyscus*, *Perognathus parvus*, and *Dipodomys ordii* (maniculatus). All were caught on the lower flatter, slightly sandier area - evidence, probably, that small soil differences determine distribution of rodents.

Richardson 1937

Barley Camp, Warner Mts., 14 mi. SW Adel, Lake Co., Oregon
 June 2, 1937 - A new camp was made last night
 in this location. Brief description of the region -
 a gradual forested slope, predominately yellow-
 pine at the lower edge where Artemisia and
 isolated or groups of junipers intermingle with
 the pines and shortly take their place! In the
 region higher up the slope, firs become more
 abundant. Aspen thickets along watercourses or
 moist valleys or slopes, are common and
 extensive. Junipers are found, though only
 occasionally, at the highest parts visited.
 Water is abundant, seeping out often on
 rather flat slopes. Indications (rodent cores
 are almost intact) are that snow has not
 been melted for very long off the ground.
 Snow banks are still present in places and
 provide water.

Cattle have been over the country generally
 the flatter, more open parts, rather thoroughly.
 It is probable that their effect has not
 been specially harmful to birds - is in
 no way comparable to a flock of sheep
 grazing over open grassland.

F. Richardson 1937

Barley Camp, Warner Mts., 14 mi. SW Adel, Lake Co., Oregon
June 2 - June 5, 1937 Birds Identified with general abundance

Turkey Buzzard	2	Western Robin	com.
Joshawk	1	Poly-crowned Kinglet	v. com.
✓ Sparrow Hawk	com.	✓ Western Warbling Vireo	v. com.
Red-tailed Hawk	com.	Yellow Warbler	uncom.
Mourning Dove	uncom.	✓ Audubon Warbler	com.
Horned Owl	uncom.	Western Tanager	com.
✓ Nighthawk	com.	✓ Evening Grosbeak	
Pacific Night Hawk	2	✓ Red Crossbill	com.
✓ Calliope Hummingbird	1	✓ Green-tailed Towhee	v. com.
✓ Lewis Woodpecker	uncom.	✓ Fox Sparrow	v. com.
✓ Hairy Woodpecker	com.	Brewer Sparrow	v. com.
✓ Downy Woodpecker		Vesper Sparrow	2
✓ Red-bellied Sapsucker	v. com.	✓ White-crowned Sparrow	com.
✓ Red-shafted Flicker	com.	California Junc	5
Wood Pewee	com.	Sage Thrasher	com.
✓ Wright Flycatcher	v. com.	Oregon Junco	v. com.
✓ Steller Jay	com.		
California Jay	uncom.		
Clark Nutcracker	uncom.		
Mountain Chickadee	com.		
✓ Red-breasted Nuthatch	uncom.	v. com. =	very common
✓ Screech-billed Nuthatch	com.	com.	common
✓ Brown Creeper	uncom.	uncom.	uncommon
Western House Wren	v. com.	✓	collected
Townsend Solitaire	uncom.		
✓ Hermit Thrush	uncom.		

Richardson 1937

14.

Barley Camp, Warner Mts., 14 mi. SW Adel, Lake Co., Oregon.
June 3, 1937 - Collecting and observation were done mostly at the lower edge of the forested area, where sagebrush occupies much space between isolated or small groups of pines or junipers. Such a habitat is probably of particular advantage to certain species of birds: Green-tailed Towhees, breeding typically in sagebrush areas, use the trees as lookout and singing perches; Fox Sparrows may often nest in close proximity to trees (aspens, pines -) though they typically forage in adjacent sagebrush or open areas; Sapsuckers drill the Western Juniper often; Sparrow Hawks seem to prefer such habitat, perching or nesting in high, isolated trees; Steller Jays, though found in the forest also, frequently pass from one large isolated tree to another, and may forage on ground between.

Woodpeckers are very abundant and are perhaps the most fully represented group of birds in this region. This may be explained by the variety of trees suiting both sapsuckers and woodpeckers, abundant insect food, natural conditions as to dead stumps or trees, a partial combination of Upper Sonoran Transition and Canadian zones with (apparently) fairly mild climate (temperature).

Richardson 1937

15

Barley Camp, Warner Mts., 14 mi. SW Adel, Lake Co., Oregon
June 4, 1937. The lack of certain species in a given region may serve as a clue to what conditions are optimum, but may be puzzling when conditions seem right for them, especially when the region corresponds to one in which the species are already known. When this latter seems true we are forced to conclude (speaking, here, primarily of resident birds) that the species has not reached a balance i.e. does not occupy all of its biotopes available, or that it is not completely resident but must wander, perhaps depending on the food supply. A related question is why do not some species increase far beyond normal, as when the food available to them seems unlimited? Partial answer to this is that we are liable to notice an abundance of food and not its paucity. Thus great swarms of insects as Mayflies may be seen but may be absent other years. The presence or abundance of a species is certainly influenced by many factors, apparently working to the best advantage of the species over the years of its evolution - years involving extremes of conditions.

Plush, Lake Co., Oregon

June 6, 1937 - Camp was made on the very valley floor in the part of Warner Valley. Brief description of region - Astunecia and Atriplex principally coming down on the dry slopes to meet the valley floor which is almost entirely of green meadow with intervening rows or clumps of willow thickets, and a large body of water with various canals or streams entering into it. Though the willow thicket habitat was duplicated at 20 mile Creek, other habitats were not and even the willow habitat is different in being purer and having different associated habitats.

Evidence of different habitats is afforded by new birds found here - as Savannah Sparrow, Long-billed Curlew, Eastern Kingbird. - The meadows have growth seldom over 18" high, mostly of grasses, rushes, iris, and dandelions. They are marshy in a few places - in which places the rushes become dominant and higher. The curlews seem most limited to this habitat in their breeding and activity. Song Sparrows, or Chats, for example, seem just as limited to the thickets, while certain birds as kingbirds and Savannah Sparrows, are associated with both.

F. Richardson 1937

Plush, Lake Co., Oregon

June 6-7, 1937 Birds Identified, with General Abundance

Turkey Vulture	Bullock Oriole	2
Marsh Hawk	✓ Savannah Sparrow	v. com.
Pintail Duck	✓ Song Sparrow	com.
Cinnamon Teal		
Mallard		
Great Blue Heron	(fairly large herony)	
Long-billed Curlew	com.	
Killdeer	2	
California Quail	uncom.	
Cliff Swallow		
Pacific Nighthawk	com	
Nuttall's Woodpecker		
✓ Red-shafted Flicker	1	
✓ Trail Thrasher	com.	
Western Kingbird	com.	
✓ Eastern Kingbird	3	
Say Phoebe		
Black-billed Magpie	v. com.	
Western Crow	v. com.	
Western Goshawk	com.	
✓ Yellow Warbler	p. com.	
✓ Long-tailed Chat	v. com.	
✓ Yellowthroat	v. com.	
Cowbird	com.	
✓ Red-winged Blackbird		
Brewer Blackbird	uncom.	

T. Richardson 1937

Flush, Lake Co., Oregon

June 7, 1937 - The effect of water supply seems clearly shown in this region in having several habitats side by side and in showing the impossibility of applying the Life Zones ^{here} in other than an association (floral, habitat) way. Thus a rattlesnake was collected in the arid region right next to the willow thickets having chats and yellowthroats.

Relations of birds to man seem to give little trouble in these parts primarily because agriculture is mostly limited to hay. This may explain the comparative tameness of such ordinarily persecuted birds as crows. A magpie was noticed hung on the wire of a chicken-pen - ostensibly as a warning to morrowning magpies, and seemingly evidence of such past action. The breeding conditions, especially for shore and water birds, in this whole Warner Valley, and the lack of indiscriminate hunting or nest destruction - give one hope for the maintenance of these birds' numbers. This desirable state of affairs is probably best correlated with the very sparse and "essential" population - the lack of the objectionable type of hunter found near centers of population.

C. Richardson 1937

Fort Warner, Hart Mts., Lake Co., Oregon

June 7-8, 1937. - A night and half a day were spent at this location - situated on the eastern, gradually sloping exposure of the Hart Mts. plateau. The whole exposure is almost continuous sagebrush with occasional groups of willows and aspens in the shallow canyons, and with an isolated stand of yellow pine (apparently the only ones on this whole side of the plateau) mixed with poplar, willow and birch; located at the Fort Warner. Even from our cursory observations, it was clear that this stand has caused a concentration of birds and of many kinds. The presence of arizonic associated birds is evidence of this - crossbills, Evening Grosbeaks, Audubon Warblers, woodpeckers and juncos. The occurrence of undoubtedly breeding Redstarts, indicates a western extension of this species, made possible by this stand of "forest".

The potentiality of such an oasis in subspeciation is of primary interest. Obviously a great many of the same species are found in comparable associations say in mountains west of Warner Valley. The question is, have these species become established by mere chance at Fort Warner, or are the wanderings of birds over relatively short distances, quite frequent?



F. T. Richardson 1937

N. base Crook Pk., Warner Mts., Lake Co., Oregon
 June 10, 1937 - A description of the type of country and its habitats were appropriate as an introduction to the birds. Camp is at about 6500' elevation, on generally gradual slopes running from Warner Valley up to the rather steep Crook Pk. The peak itself is mostly bare and rocky with fairly large brush area below. Firs predominate in the forest just below this, while coming to lower, flatter areas, large stands of yellow pines occur, typically mixed with fewer large firs. Young pine and fir form frequent thickets as do Manzanita and other shrubs occasionally in the forest itself. Typically the ground in the forest is almost free of vegetation save for several small shrubs and a dwarf (up to 6") Berberis. Surface water is abundant. Where it is concentrated into streams, meadows occur, with Tillium (?), aspen groves are frequent, and willow shrub thickets also in places. Aspens also occur in several places where water does not reach the surface. The birds present can be correlated with these distinct habitats and the abundance of birds in general with the variety and extent of habitats.

Richardson 1937

N. Lake Crook Pk., Warner Mts., Lake Co., Oregon
 June 11, 1937 - This region seems to be one in which natural conditions and balances are almost unaltered, evidenced in part by the variety and abundance of birds. Logging has not been done and cattle appear not to have been in the region. Goshawks, day predators, are present and Saw-whet Owls, night predators, also. Steller Jays are present in normal (perhaps) numbers. Almost all the woodpeckers that might be expected, save the Pileated and possibly the American 3-toed, have been seen. This may be due to variety of habitat (including large Yellow Pine stands) and also to optimum food conditions.

Breeding status of birds, as far as known, may be summarized:

Eggs: Juncos, Green-tailed Towhee, Townsend Solitaires

Young: Hairy Woodpecker, (very young)

Probably many other species have eggs but few young - the young being more easily found as a rule! It seems true that any valid generalizations on time of nesting in life zones, must be based on rather complete information, perhaps not possible on such a collecting trip as this.

Richardson 1937

Nhase Creek T.B., Warner Mts., Lake Co., Oregon
 June 9-11, 1937 Birds Identified with Fair Abundance

Turkey Vulture		Mountain Chickadee	
Red-tailed Hawk		✓ Hermit Thrush	v. com.
✓ Goshawk	3	Ruby-crowned Kinglet	v. com.
Sparrow Hawk	1	Western Noddy Vireo	com.
Mourning Dove	uncom.	Anderson Warbler	com.
Horned Owl		Western Tanager	com.
Saw-whet Owl	2	Evening Grosbeak	?
✓ Calhoun Hummingbird	com.	Black-headed Grosbeak	com.
Red-shafted Flicker	com.	✓ Red Crossbill	v. com.
White-headed Woodpecker	1	✓ Green-tailed Towhee	v. com.
✓ Arctic 3-toed Woodpecker	com.	✓ Fox Sparrow	com.
✓ Williamson Sapsucker	uncom.	Brewer Sparrow	
Red-naped Sapsucker	com.	White-crowned Sparrow	com.
Downy Woodpecker	uncom.	Cassin Purple Finch	com.
✓ Hairy Woodpecker	com.	✓ Oregon Junco	v. com.
Wood Pewee		Song Sparrow	uncom.
✓ Night Flycatcher	com.		
✓ Steller Jay	com.		
✓ Mountain Chickadee	v. com.		
✓ Red-breasted Nuthatch	uncom.		
✓ Slender Billed Nuthatch	uncom.	v. com. = very common	
✓ Pygmy Nuthatch	uncom.	com. = common	
✓ Brown Creeper	uncom.	uncom. = uncommon	
✓ Western House Wren	com.	✓ = collected	
Townsend Solitaire	com.	# o. indicate rarity	
Western Robin	com.		

Richardson 1937

1 mi. S East Lake, Paulina Mo., Deschutes Co., Oregon
 June 13, 1937 - The region studied in is between 6,000-7,000', the lower country having some yellow Pine, Lodge Pole Pine becoming dominant higher up, with fairly large extents of Hemlock seemingly on high North slopes. Surface water and vegetation are almost entirely lacking, save for sparse grass clumps in some places and a little manzanita (*Arctostaphylos*). This seems due entirely to the porous nature of the pumice ground and the very little thickness (c 3") of humus or soil.

East Lake (or Paulina Lake) being an isolated body of water in this whole mountain region, might show interesting relations to birds or other animals. East Lake was only cursorily seen. A Barrow's Golden-eye was seen in it, and robins were seen around the shore. A deafening chorus of Hyla was heard at night - evidence of their concentration around the lake.

Whether one considers food, soil or vegetation the primary factor in bird presence or abundance, it seems equally true that they combine in this region - little soil giving little vegetation giving little plant or insect food, giving a paucity of birds.

F. Richardson 1937

1 mi SE East Lake, Paulina Mts., Deschutes Co., Oregon
 June 13-15, 1937 Birds Identified with great Abundance

✓ Sharp-shinned Hawk	1
Golden Eagle	1
Mourning Dove	un. com.
✓ Hairy Woodpecker	un. com.
✓ Mountain Chickadee	com.
✓ Red-breasted Nuthatch	un. com.
✓ Brown Creeper	1
✓ Hermit Thrush	com.
✓ Ruby-crowned Kinglet	com.
Mountain Bluebird	2
✓ Red Crossbill	v. com.
Brewer Sparrow	
✓ Oregon Junco	com.
✓ Pine Siskin	v. com.
✓ Cassin Purple Finch	com.
✓ Clark Nutcracker	com.
✓ Chipping Sparrow	v. com.

Of the above species, the crossbills and siskins are perhaps the only really very common birds, while most of those marked common are so only in a relative sense (for this particular region) but are uncommon if compared to their commonness as at Cross Peak (see p. 22).

Richardson 1937

1 mi. S East Lake, Paulina Mts., Deschutes Co., Oregon

June 14, 1937. - Siskins and purple-finches were observed today coming to a pool of water in the road to bathe. Perhaps longer observation would have shown them to be drinking as well. Such bathing habits are of interest in that this man-made pool offers, ephemeraly, the only bathing place in the entire region outside of Paulina and East Lake - probably too distant to be considered. The present atypical rains and such a transitory bathing place seem to indicate that bathing is not essential to the well being of birds of the region. On the other hand, the paucity of birds may be explained in part by the normal lack of surface water. - That birds can bathe in the rain seems quite true, but following drying or sunny weather may be requisite.

The feeding together of crossbills and siskins is of interest in the light of their probable phylogenetic relationship, and especially since typically, closely related birds have quite different forage habits. However, it was not determined if siskins opened their own hemlock cones or perhaps gleaned seed from cones opened by crossbills.

F. T. Richardson 1937

3 mi. W Pankhatche, Deschutes Co., Oregon
 June 16, 1937 - A fairly detailed description of
 this region and its habitats may be in order
 for we hope to study all the birds of
 the region in our probably weeks' stay.
 Camp is at about 5700'. Generally gradual
 slopes upward from it lead to an
 extensive hemlock forest. The forested
 slopes below this all the way down
 into the Deschutes Valley, except where
 extensive logging has been done, are
 typically of dense lodge-pole Pine growth,
 with stands of large yellow Pine, pure
 or mixed with white Fir usually on
 the low flat ridges. Stands of yellow
 Pine alone become most extensive on gentle
 slopes toward the lower valley. Stands
 of purely white Fir are infrequent occurring
 usually on sides of ridges (North?). Brush
 (Manzanita, Ribes etc.) occurs sparsely below
 big timber, more thickly on exposed
 slopes, continuously almost in heavily
 logged regions.

The region then, as mountain country,
 is relatively flat, with the exception of
 the deeper gorge (sides up to 100') of Pankhatche Cr.
 The shallow down-mountain valleys have
 broad tracts of dense lodge-pole Pine.

Fishback 1937

3 mi. W Paulina Lake. (Cont.)

June 17, 1937 - Though yesterday's collecting seemed auspicious, it was of generally common species as Hermit Thrushes and Juncos. From observation today it seems that more uncommon species will be very hard to collect. For instance, though 1 Stellar Jay has been collected (A.M.) I have not seen or heard a single one. Again, though a sapsucker was heard once - not one has been seen. The only woodpeckers seen have been the Hairies, though reports indicate more abundant and possibly other woodpeckers.

This paucity of certain birds or groups of birds (though in some cases an abundance when compared to 1 mi. SE East Lake region) is perhaps again explicable on the basis of little surface water, animal vegetation and insect and plant food. Birds seem generally lacking in the dense stands of lodge-pole, but become more plentiful in the more open Fir-Yellow Pine regions, especially where brush with open forage ground is more prevalent. The very limited grass and low willow by Paulina Cr. seem too small to be effective.

Rushden 1937

3 mi. W Paulina Lake, (Cont.)

June 18, 1937. We have had good opportunity to-day and on past days to compare collecting in rain or drizzle, in cloudy weather, or in sunny or intermittently sunny weather. The fact became unescapable that collecting becomes much more difficult when weather is rainy or continually cloudy. We may grant that birds are generally actively feeding in bad weather but yet, and especially in forested or brushy country, we can best find birds by their songs and call notes. These songs and calls are noticeably diminished or quite absent in bad weather. Call notes may occasionally be heard in bad weather when no songs are heard, but even calls may be nearly unheard in steady rain when birds generally seek protection and are quiet vocally and physically. - The repression of bird song by bad weather has no lasting vigor effect on this song for song may be started with full vigor on sudden clearing.

A comparison of singing at night to singing in the rain might be appropriate for each seems to illustrate instinctive action occasionally so strongly urged as to take place under abnormal conditions.

F. Richardson 1937

3 mi. W Paulina Lake (cont.)

June 19, 1937 - Direct association of birds with water can be studied to advantage in this region of little water - though the atypical rainy weather so continuous of late has made this more difficult. A pipe-line spouts water near camp - some $\frac{1}{4}$ mi. from Paulina Cr. A Ruby-crowned Kinglet was seen bathing at this spout. If baths are essential to the well being of birds such a water source might be invaluable in a region of little water. Coo in Solitary Vireos and Western Flycatchers have been collected near Paulina Cr. - probably an insect food relation. Robins can be found along the creek but rarely far from it.

The effects of logging can be seen best in regions below camp where brush (*Mangonia* sp.) almost covers tracts where forest must have been originally quite heavy. In this region of brush and no trees Green-tailed Towhees are common (not seen at all in surrounding forest) and Fox Sparrows are common (uncommon in surrounding forest with less brush). Evidently man has effected an increase in these species and perhaps a decrease in others, in so changing the habitat conditions.

F. Richardson 1937

3 mi. W Paulina Lake (cont.)

June 20, 1937 - Comment of a general nature concerning the whole trip, now seems in order! Life Zones have been applicable to both plants and animals - but the limitations of this application have been obvious. Certainly if the markers of Life Zones have ^{to be} very carefully chosen (because they include most of the forms to which the zones can be applied) then this system loses much of its value. However, though many birds (flickers, Red-tailed Hawks, vultures, Brewers Blackbirds, ^{etc.} Pormils) and plants (*Artemisia* etc.) and mammals (porcupine, coyote,) show a range of two or more life zones, they are offset by a larger proportion of forms which do conform fairly well to Life Zones. But though this system is thus justified, I think that a combination with a system of floral-habitats might be to good advantage.

The general abundance of birds during the trip, except in inhospitable regions, has been most heartening and testifies to an almost natural balance between the various species ^{and} rare in more civilized country. predators, "game" birds etc.

F. T. Richardson 1937

3 mi. W Paulina Lake (cont.)

June 21, 1937 - Little mention has been made of the mammals of this region as their observation and collection has been secondary to birds. The ubiquity of Callospermophilus has been noticed. Both townsendi and amoenus chipmunks have been collected. Their inactivity in the open on rainy or continually cloudy days has been noticeable. E. townsendi is comparatively rare.

Last night 46 mouse traps were set out along and on slopes near Paulina Cr. The catch may be summarized thus:

10 traps in timber S of Paulina Cr. → 2 Peromyscus

12 traps just above steeper S edge

of Paulina Cr. → 1 Peromyscus

14 traps along creek border in → 2 Microtus

grass + low rushes → 2 Bufo

10 traps on brushy slopes N of creek → 7 Peromyscus

the brushy country, and this is the heavily logged area, seems to offer most favorable conditions for Peromyscus. The grass and rushes are limited to the creek's immediate banks and Microtus could probably be caught nowhere else. About half of the Peromyscus are young - early breeding compared to birds, perhaps.

Richardson 1937

3 mi. W Paulina Lake, Deschutes Co., Oregon
 June 16-22, 1937 Birds Identified, with Genl. Abundance.

Red-tailed Hawk	+	Lutescent Warbler	1
Western Goshawk	com.	Audubon Warbler	v. com.
Sparrow Hawk	1	Western Tanager	com.
Sharp-shinned Hawk	1	Evening Grosbeak	2
Horned Owl	com.	Red-crossbill	com.
✓ Tawny Owl	1	✓ Green-tailed Towhee	com.
✓ Hairy Woodpecker	v. com.	✓ Fox Sparrow	com.
✓ Arctic 3-toed Woodpecker	2	✓ Oregon Junco	v. com.
Pileated Woodpecker	1	Chipping Sparrow	uncom.
✓ Williamson Sapsucker	com.	Osprey	2
✓ Bright Flycatcher	com.		
✓ Western Flycatcher	com.		
✓ Olive-sided Flycatcher	1		
✓ Steller Jay	uncom.		
✓ Red-breasted Nuthatch	v. com.		
✓ Slender-billed Nuthatch	com.		
✓ Mountain Chickadee	v. com.		
✓ Brown Creeper	com.		
Townsend Solitaire	uncom.		
Western Robin	com.		
✓ Hermit Thrush	v. com.		
✓ Ruby-crowned Kinglet	v. com.		
✓ Golden-crowned Kinglet	uncom.		
✓ Western Warbling Vireo	1		
✓ Solitary Vireo	uncom.		
✓ Calaveras Warbler	uncom.		

v. com. = very common

com. = common

uncom. = uncommon or rare

#s indicate rarity

✓ = collected

Richardson 1937

Yellow-haired Porcupine (*Erethizon epixanthum*)

June 4, 1937 - Barley Camp, Harney Mts., Oregon - A large adult was discovered in juniper-sagebrush association. It was descending slowly ^{backward} down a small juniper - using the tail as support against the tree-trunk. From the tree he proceeded across open ground through the low sagebrush. First was noticed his stinging (especially in comparison to other rodents) unconcern in being exposed and active in broad daylight. He did not apparently look for any enemies at any time. He looked at me on my yelling but went on shortly and just as slowly. On being closely approached (say 10') he stopped, turned his back toward me - arching it to expose the most prominent posterior region of spines. On being prodded or very closely approached, the arched position was even more exaggerated, the head being thus better protected or less exposed (probably this same tendency to protect the vital head has been influential in the evolution of armadillos, hedgehogs -) and lashed the tail. - A profitable parallel may be made between this animal and the sloth. In both, tree (bark or leaf) eating seems correlated with spines or very tough hide, slow movement, poor vision, and climbing adaptations.

Richardson

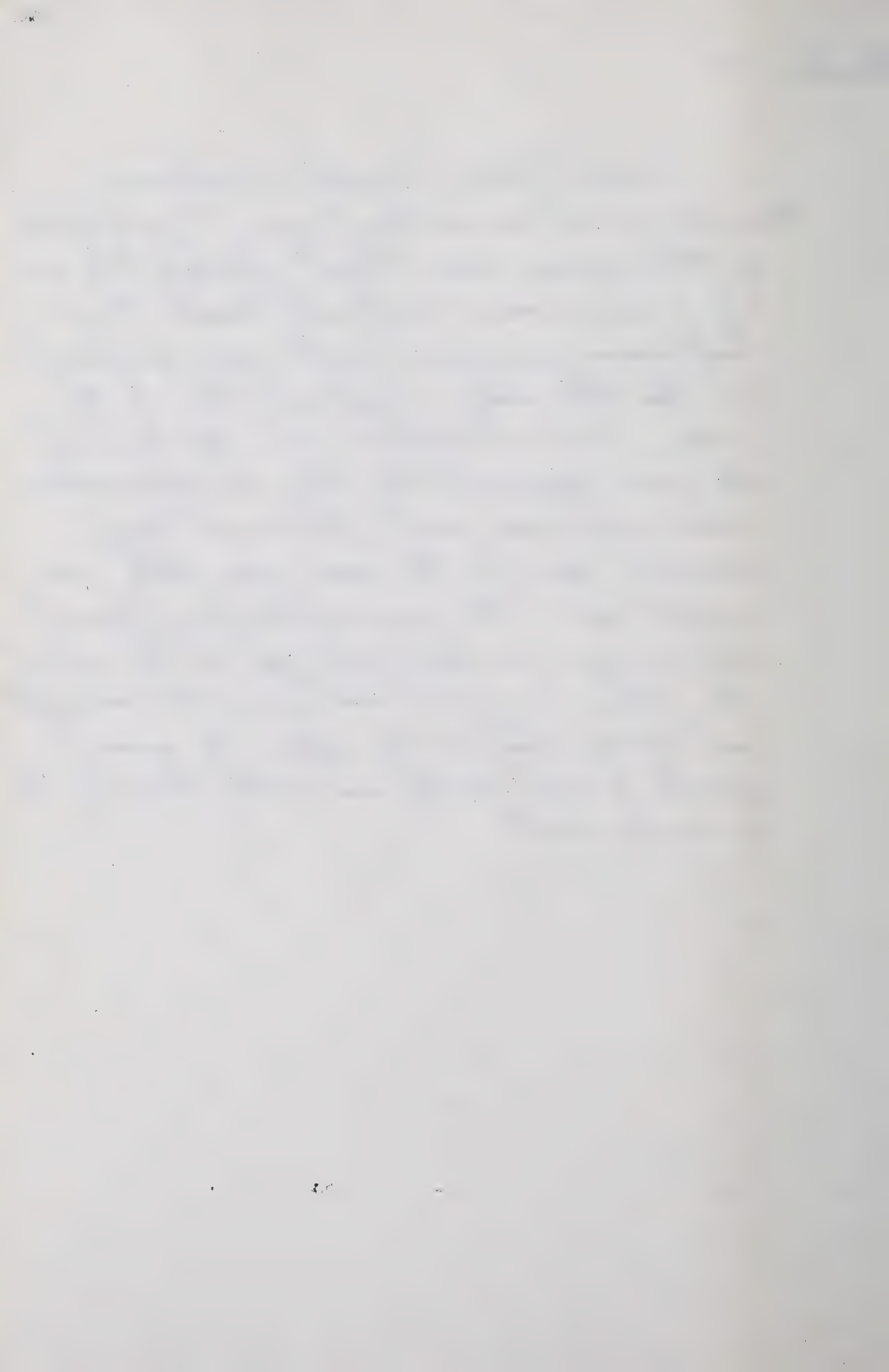
Coyote (*Canis latrans*)

June 1, 1937 SE end Warner Valley, Oregon - A coyote was watched from a distance of about 100 yards for some 15 minutes. He apparently did not see us during this time, but suddenly, probably on seeing us, ran rapidly away. When first seen, he seemed to be approaching a crane. The crane must have been able to see him, though, and the two did not come closer than 20-30 feet. The coyote was visible at all times as he slowly walked or trotted through the low grass and rushes. Probably he was intent on finding eggs or young, as of ducks. A pair of Marsh Hawks resented his presence with cries and several ineffectual "toops". Obviously and abnormal abundance of this predator might seriously affect breeding ducks, geese etc.

Richardson 1937

Canada Goose (*Branta canadensis*)

June 1, 1937 - SE end Warner Valley, Oregon - Two families of these geese seen, though perhaps the one of 10 young was a combined brood. These 10 half-grown young and parents were surprised by the lake's edge - did not take to the water but went farther upon the land into the "grass" (*Sirifus*?). There they disappeared from view and were quiet. They must have crouched low for the cover was little over a foot high. The second family of parents and 5 young was also surprised at the edge of the water. One parent and ^{the} young (still very small and downy) took to the water! The second parent honked loudly and shortly flew low to a nearby point.



Richardson 1937

Mallard Duck (*Anas platyrhynchos*)

May 27, 1937 opening of 20-mi Cr. into Warner Valley, Oregon

Two nests, from which ♀s were flushed, were found and probably two others could have been found with more search. Both nests were located under sagebrush in this area of high chaparral. Curiously, the first nest found was about 100 yards from the nearest small tributary of 20-mi Cr. although within 75' of several small pools not more than 2' across or 10' long. The young ducks must either be led to the distant running or more extensive water, or must grow up on the very small pools already mentioned. The former seems more likely for the small pools are drying up. The nesting of Mallards in this habitat cannot be considered atypical for they are common here.

May 29 as above - Another nest found, with only 5 eggs compared to " in one of May 27. Probably this time of year is about the start of duck breeding.



C. Richardson 1937

Golden Eagle (*Aquila chrysaetos*)

May 25, 1937 north 20 mile Cr., Warner Valley, Oregon - A pair of these birds first seen flying high above canyon. They suddenly swooped completely folded their wings and plummeted obliquely across and down toward the north ridge of the canyon. A little later (c. 6:00 P.M.) one, and possibly two, eagles flew low along the side of this canyon's south ridge. A pair of Red-tailed Hawks appeared above the eagle and several times, as individuals, dived on the eagle in bold, long vertical plunges. This was done with such agility that the hawks were at first mistaken for Prairie Falcons, which I already know, may drive Golden Eagles from either their territory or their own.

Richardson 1937

Western Goshawk (*Accipiter striatus*)

June 11, 1937 - N. Lane Creek Pk., Warner Mts., Oregon - A second specimen was collected today - a much larger bird (♀) compared to the ♂ already collected. A noise of beating wing and breaking branches some 15 yds. from camp, called my attention to the bird - apparently just after it had made an unsuccessful ^(apparently) stop for some bird or mammal. On seeing us it flew partly toward us up toward the top of a pine. This lack of wariness in relation to man shown in this bird and the collected ♂, may indicate a lack of contact with man or a temperament comparable to the white-tailed Kites - something apart from the defense of a breeding territory.

June 13, 1937 - 1 mi. S East Fork, Pauline Mts., Oregon - The above specimen was prepared today. A comparison to the previously collected ♂ (A.H.M.) in certain respects, is of interest.

Wt. ♀ 1040 g ♂ 600+ Can this considerable sexual difference be correlated with life-history - perhaps but attempted in this species where sexual dimorphism is very marked? Does the ♀ have the "lion's share" in activity as nest building, feeding young, defending nest etc.?

Iris color - ♀ Cass red ♂ yellowish red

Richardson 1937

Western Goshawk (cont.)

June 13, 1937 - 1 mi. S East Lake, Paulina Mts., Oregon (cont.)

Food - both ♂ and ♀ had only mammal remains, fur and crushed bones, in their gizzards. This is at variance with their reputed preference for birds - and is of special interest because the region where these birds were collected abounded in birds of all sorts.

June 21, 1937 - 3 mi. W Paulina Lake, Deschutes Co., Oregon

A young goshawk, noticeably brown, was seen today as it flew over and around an open, partly timbered ridge. It approached unnecessarily near me overhead - as though from curiosity. At least one mature goshawk has been seen several times in the general region - testifying to their relative abundance here as in the Crab T. B. region.

F. Richardson 1937

Long-billed Curlew (*Numenius americanus*)

June 6, 1937 Fresh, Lake Co., Oregon - About 6 of these birds were observed in the more open region of meadows - a region probably a mile from the lake, but connected to it by nearly canals. This species is apparently breeding, though nests were not found, for the birds were very noisy, circling fairly low with loud cries, whenever a certain region of the meadows was approached. - Is there possibly a positive correlation of size of bird and noise when nest region is approached? This seems true if comparing most passerines to gulls, Curlews, Falcons etc., but not true with noisy Killdeer, silent eagles (golden), some ducks etc. Perhaps the correlation is better with openness of nest site - and this would explain the general noisiness of Charadriiforms.

Richardson 1937

Mourning Dove (*Zenaidura macroura*)

May 25, 1937 north 20 miles Creek, Warner Valley, Oregon - This species is quite abundant as at least 35 were seen during the day. About 20 were seen feeding on a small dirt road at about 5:15 A.M. This would indicate that either this species is not breeding yet or that they have communal feeding grounds even when breeding. The lateness of the year seems to imply breeding but inclement weather may have postponed breeding. At least 6 single birds have been seen during the day - going either up or down the canyon.

May 26, 1937 as above. Doves were more closely noticed today. Several were seen to be paired. It seems probable that this species is just beginning its breeding - that birds are now becoming paired.

Richardson 1937

Nuttall Poorwill (*Phalaenoptilus nuttalli*)

May 25, 1937 Mouth 20-Mile Cr., Warner Valley, Oregon - Two birds flushed from ground on south slope of canyon in low sagebrush at c 5:30 A.M. No nest was found, but will be looked for later. In any case it is of interest that the two birds were roosting together. They gave several low, mellow notes - flew to widely separated parts of the hillside.

June 4, 1937 Borley Camp, Warner Mts., Oregon. - This species is also common at this higher elevation - but is still associated with open sagebrush country. One bird, a ♂, was collected about 8 P.M., as it was calling from the very top of a dead tree about 20' high. Do birds generally call from the ground? Do they prefer higher perches if such are available.

F. Richardson 1937

Pigmy Owl (*Glaucomis grisea*)

June 18, 1937 - 3 mi. W. Paulina Lake, Deschutes Co., Oregon -

A single bird was collected this morning in a dense growth of young lodge-pole Pine. The weather was intermittently cloudy and rainy - the time about 9 A.M. The Pigmy Owl note was being used by me to attract small birds - as both Dr. Miller and I have been doing continually in this whole region. The note was answered by the owl which continued to give it from another point (c. 100' away) even after I missed the first shot at it. Such "stupidity" or "lack of fear" seems to testify to the owl's rarity in this region - or we should have collected specimens sooner. Chickadees (2) were near and watching the owl at its first perch - though these birds had not come readily to my owl notes this time.

Dissection shows this owl fed recently on a complete white-footed Mouse. This may be an exception to the Pigmy Owl's bird diet but does not explain the reaction of small birds to the owl's presence or notes or their "fearfulness" in close approach of the owl.

Richardson 1937

44.

Hairy Woodpecker (*Dryobates villosus*)

June 21, 1937 - 3 mi. W Paulina Lake, Deschutes Co., Oregon

This seems to be the only species of woodpecker, excepting Williamson Sapsucker, in this whole region. The presence of fine and varied stands of trees seems to make this inexplicable and we must look for a more subtle reason for the paucity of woodpeckers. Food supply seems most likely. The presence of Hairy Woodpeckers rather than other woodpeckers (excepting such atypical ones as flickers & sapsuckers) may indicate ^a generalized condition and hence greater adaptability to conditions not quite optimum for woodpeckers in general. It may indicate, instead or as well, a more "arrogant" nature in establishing territorial rights.

Both Hairy nests have well developed young - in fact in one nest at least one young has left the nest cavity. This youngster was found on this cold rainy morning, squatted under a dead log with his head buried in his back - except when he uttered squawks for food. This indicates some ability of young to find needed protection.

Richardson 1937

Red-naped Sapsucker (*Sphyrapicus varius*)
June 4, 1937 - Barley Camp, Warner Mts., Oregon - This species is abundant in this region, though it may at times show Red-breasted characters in having red in the black upper-breast band! - Workings, in order of their abundance, have been seen on Western Juniper, aspen, and fir. The birds, though specially favoring junipers, were not seen in the more extensive juniper groves above 20-miles Creek. The association with aspen (*Populus tremuloides*) is of interest as compared to workings of a Red-naped Sapsucker in a small and only group of young poplars on the Berkeley Campus the last winter.

Richardson 1937

Red-shafted Flicker (*Colaptes cafer collaris*)

June 2, 1937 - Barley Camp, Warner Mts., Oregon - A flicker was heard digging inside a Yellow Pine stump. It stuck its head out of the hole in response to imitation flicker cries - but on seeing me it would not come from the hole but disappeared into it and remained inside, not digging further, for the minutes or so I tried to entice it out. - This seems to show a use of the hole for protection, though several days ago a flicker at once flew from its hole when approached. However, it had been able to watch my approach and leave when I was not very close. - This bird, or its mate, of June 2, was collected. It seems to be a typical ♀ Red-shafted but curiously has one of the central pair of rectrices colored yellow. This feather seems as worn as the others, yet it may have grown in at a different time (not during usual molt). An affinity or correlation with feather pigmentation of the yellow-shafted Flicker, seems probable, if the two yellows (of all colors) match.

Richardson 1937

Eastern Kingbird (*Tyrannus tyrannus*)

June 6, 1937 - Plush, Warner Valley, Oregon - Three of these birds were collected in the open meadow - willow thicket association - the meadow, though cultivated (hay) in part, being quite unassociated with civilization. A pair was first seen and one bird collected. This proved to be the ♂ - with testis hypertrophied. A nest in process of construction was found. The mate, though rather wary, was seen to bring nesting material shortly after the first bird was collected. The nest is in a dead, small, willow, about 10' high.

June 7, 1937 - Plush, Warner Valley, Oregon - The mate, ♀, of the above ♂ was collected while returning to the nest - probably still actively constructing it. It seems significant that the nest building instinct has been powerful enough in the ♀ to hold away after the absence of the ♂. Yesterday, the ♀ did not approach me at all when the ♂ was shot - this in contrast to ♀ of other species who may be actively alarmed by the dead ♂ and closely approach it (spec. Brewer Blackbird). The time in the nesting cycle is probably influential in this problem.

Richardson 1937

Black-Billed Magpie (*Pica pica hudsonia*)

May 25, 1937 - north 20 mile Cr., Lake Cr., Oregon - This species is fairly common here although it may not at first appear so, due to its typically solitary habits (especially foraging in this region) and relative quietness compared to its striking coloration. That this species seems to be dominated by other and smaller species is always interesting and curious. The California jays were twice seen to chase a single magpie. Brewer Blackbirds also were seen to chase a magpie. The molting immatures or submission of these birds may not be a key to their shyness as in foraging on eggs or young, however. Several birds were observed foraging on the canyon side, between the small sagebrush bushes. The use of the tail in climbing up-hill was noted - apparently it was used for balance, as by moving to side.

May 30, 1937 as above - One magpie seen chasing an owl (very probably a long-eared Owl) from one willow thicket to another, at about 8:30 A.M.

June 6, 1937 - Plesh, Warner Valley, Oregon - Young are very much in evidence here - because of their numbers and noisy cries. This contrasts with 20 mile Cr. a week ago, where no young were out of the nest, perhaps none born.



Richardson 1937

Plumbeous Bush-tit (*Psaltriparus plumbeus*)

May 27, 1937 opening of 20-mi. G. into Warner Valley, Oregon

Two birds seen and collected - probably each was one of a pair. These were the only Bush-tits seen or heard by any of us as yet & so the species may be tentatively considered uncommon. The type of habitat, that of high sagebrush (c 3-6') is barely represented in the canyon proper, but here at the broad outer mouth of the canyon, is fairly extensive (perhaps 10 acres). Both birds were foraging in sagebrush (probably *Artemisia tridentata*).

May 28, 1937 - W. rim 20-mi. G., Warner Valley, Oregon

Two bush-tits were again collected but this time high up in region of junipers. This argues against this species being closely limited by altitude but the habitat may remain essentially the same for *Artemisia tridentata* extends all the way up the sides of 20-mi. G. canyon. These two specimens probably represented 2 pairs (evidence being, in part, that ♀ 69 as ♀ 67 of May 27, had a large brood patch). However, one bush-tit was heard later in the day by camp and seemed to be traveling down canyon probably not breeding yet.

The data on iris color from the four specimens collected by now is of interest. Both ♀s, 67 + 69, had a completely yellowish-white

Richardson 1937

Bush-tit (cont.)

May 28, 1937 W rim 20 mi. N., Warner Valley, Oregon cont.
 iris This eye "ring" was visible on the ♀67
 from a distance of about 25'. Both ♂s, 66 +
 68, lacked the yellow iris but 68 had a light
 brown inner part of the iris. Tentatively, ♀s
 characteristically have this eye "ring", while ♂s
 do not but may show some lightness in the
 iris. This is at variance with the Coast
 Bush-tit. A specific variation? Constant?

Richardson 1937

Red-breasted Nuthatch (*Sitta canadensis*)

June 16, 1937 - 3 mi. W Pauline Lake, Deschutes Co., Oregon

A single bird was seen entering a hole (apparently of a woodpecker) about 25' high in the trunk of a live white Fir. This may be a nest cavity, but if so probably could not have been excavated by this species in hard live wood - or may only be a roosting cavity. This ^{is at} likely for the first entered late in the twilight and was not seen to come out.

June 19, 1937 - as above - The above mentioned cavity is evidently not used as a nesting cavity for birds have not been seen around during the day. If it is assumed then that this species generally roosts in cavities, it becomes of interest to know the exact position in roosting. If the floor of the cavity were fairly wide and flat, the nuthatch could roost on it in a relaxed horizontal position. If it were vertical and narrow, the position of the bird would have to be a clinging one. This were of interest in its effect on development of leg proportions, musculature etc. for as is shown in various swifts' spread tails - a perching habit alone can give rise to a marked structural adaptation.

Richardson 1937

Western House Wren (*Troglodytes aedon parkmanni*)

May 26, 1937 c. 1 mi. up 20 mi Cr. Warner Valley, Oregon. - A pair of this species found nesting in a woodpecker hole in a large cottonwood. Young were being fed. This small group of large cottonwoods might be studied with interest for they are almost the only large trees of the whole region.

June 4, 1937 Barley Camp, Warner Mts., Oregon. This species is very abundant especially in open thickets with some undergrowth. Its wide occurrence from valley to mountains, indicate its adaptability and perhaps therefore its constancy of one subspecies in the whole west. - Birds (House-wrens) seen in very early morning sunlight, looked strikingly yellowish. This may be the nature of the light alone or possibly a combination of it and the brown wren plumage.

Richardson 1937

Western Robin (*Turdus migratorius propinqua*)

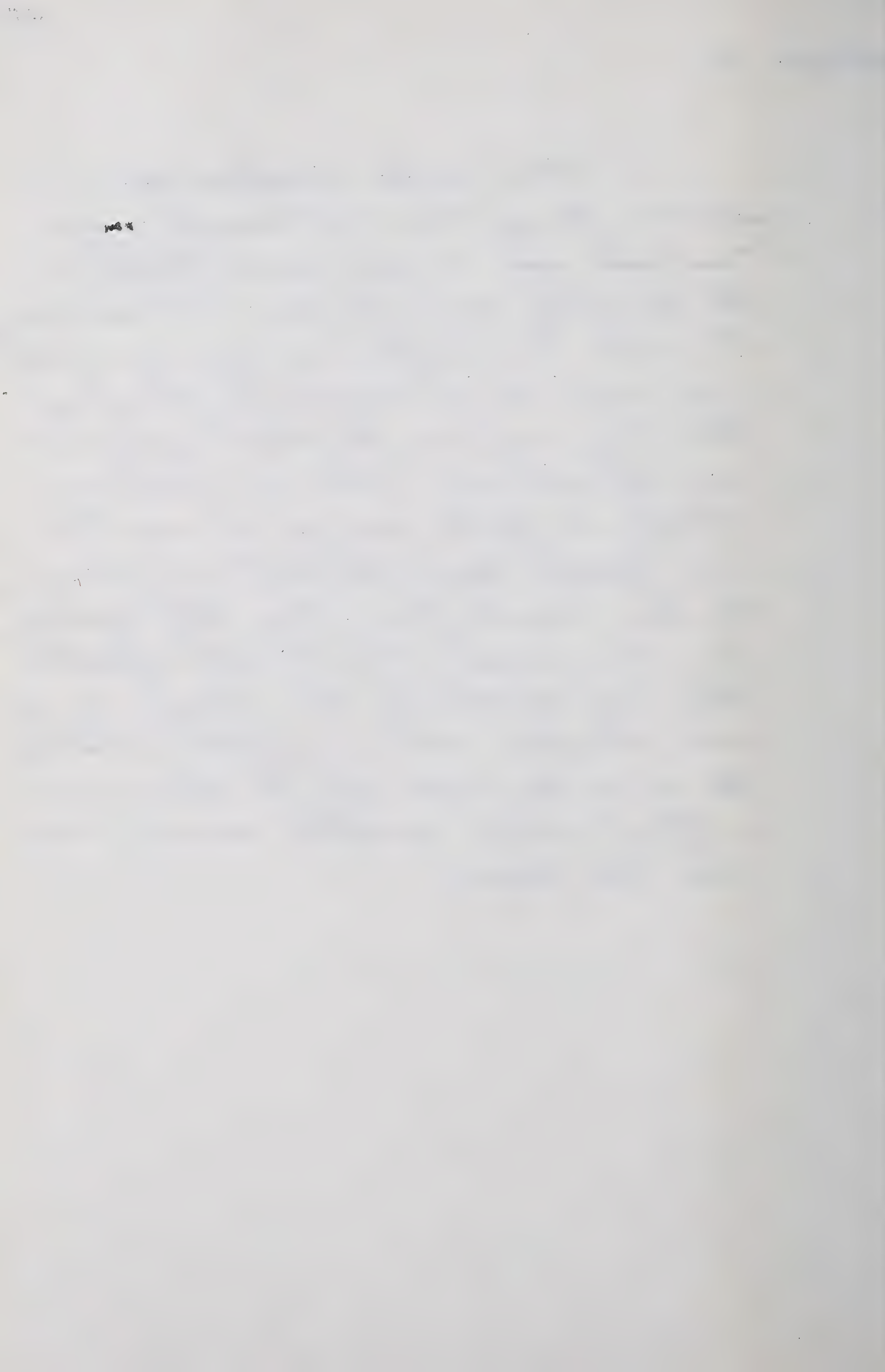
May 26, 1937 c 1 mi. up 20 mi. A., Warner Valley, Oregon - A nest of this species found about 12' high in one of a small group of large cottonwoods. (See comment of May 26 under Western House Wren) A study of the nesting sites of other robins in this canyon, might prove of interest.

June 21, 1937 - 3 mi. W Paulina Lake, Deschutes Co., Oregon - This species, though seen at various places since the above notation, has not been common. However, in this region they are relatively common due to a concentration near Paulina Creek. This is the only creek or even running or standing water, in this whole mountain area. Tentatively there is a good relation as to meadow or stream-side, but this was not definitely ascertained. No robins have been seen or heard except in the vicinity of the stream.

Richardson 1937

Yellow Warbler (*Dendroica aestiva*)

May 29, 1937 - opening of 20 mi. N. into Warner Valley, Oregon
 Two birds seen in and around thickets in this principally sagebrush area. The birds, staying the whole time within an area say 30 yards across, were almost incessantly chasing each other. This went on for about 10 minutes - was still continuing when one bird was collected. No fights were seen to occur. The birds typically stayed well apart (5-10') during the chase; several times they both perched for a few seconds but still well separated. Both birds chased the other though no regular alternation could be detected. Tentatively this was a pair ($\sigma + \sigma'$) and the chasing was a type of mutual courtship seemingly very much like playing.



Richardson 1937

Nevada Cowbird (*Molothrus ater antennisiae*)

May 29, 1937 opening of 20 mi. G. into Warner Valley, Oregon
Two birds, ♀ + ♂ collected in willow
thicket. The ♀ was collected first. The
♂ appeared a few minutes later and
on the same dead branch as the ♀.
Probably this was a pair of cowbirds
tending to support Friedmann's conclusion
on pairing in cowbirds. The ♀ was found
to have an egg in the duct indicating
that active parasitism is going on at
what seems to be the start of the
breeding period in small birds, as yellow-
throats, of this willow-thicket habitat.

Richardson 1937

Brewer Blackbird (*Euphagus cyanocephalus*)

May 25, 1937 north 20-mile Cr., Warner Valley, Oregon - This species is one of the commonest. It seems to have at least a partial riparian habitat - in contrast to the "domesticated" Brewer Blackbirds of California, but similar, probably, to the mountain breeding (as in Yosemite Valley) population of California birds (Blackbirds). All birds seen paired here. One ♀ was collected about ready to lay eggs - another with very extensive brood-patch (bare skin including belly and much of breast).

June 9, 1937 - N. base Crook Pk., Warner Mts., Oregon - The ubiquity of this species may well be commented on for it ranges from the low valley floor up high into the mountains. However in the low valley it is generally found near slight slopes with *Artemisia* and perhaps nearby running water. In the mountains, as in this region, the birds have been seen up to 6500', but only in the stream-willow-meadow association.

Richardson 1937

Red Crossbill (*Loxia curvirostra*)

June 8, 1937 Fort Warner, Hart Mt., Warner Valley, Oregon

Though this species was seen and collected in the Warner Mts., it seems very abundant here. This may be because of the very limited area with Yellow Pines & a consequent concentration of the birds. Several points where these birds seemed consistently foraging, were observed. Many of the cones, the new (just opened ones), were completely without bracts, leaving just the core. That this was not the work of squirrels was obvious as birds were seen working on the cones partially denuded, and the work was evidently not that of a gnawer as bracts were broken off leaving many fibers. Cones seemed typically attacked on the side, first - though the starting point probably depends more on the most convenient perch - either on the cone attacked or on adjacent cone or branch.

June 14, 1937 East Lake, Paulina Mts., Oregon

This species is the most abundant of all species in this region - a region of Lodge-pole Pine and Hemlock, with practically no surface water and vegetation. Large flocks (up to 500 even) of the birds fly over quite often and have been seen and heard feeding in the Hemlocks. The seeds of

Richardson 1937

Red Crossbill (cont.)

June 14, 1937 East Lake, Paulina Mts, Oregon (cont.)

the Hemlock cones appear to be the only food available for them in this region, so that this floral association is very definite. It were interesting to know if Crossbills are equally abundant in these mountains in the lower Yellow Pine region, i.e. is a preference for Hemlocks shown? This may be, for the cone-bracts are much thinner and the seeds more easily obtained.

Dissection of specimens collected show the gonads to be extremely small (testes usually 1-2 mm), though most birds are at least starting the nesting cycle. Though this may explain the flocking in part it does not explain the irregular breeding. One cannot readily admit that crossbills are not subject to the general sexual cycle of birds as shown by many workers (Rowan, Bissonette, Knudsen, etc.).

Richardson 1937

Brewer Sparrow (*Spizella breweri*)

May 26, 1937 north 20 mi Cr., Warner Valley, Oregon. - As mentioned in the general comment for today, this species was common on a high sagebrush mesa. Many birds were singing but the establishment of definite territories was obscure (probably so little time was had for study). One bird was seen with nesting material. A second bird stayed near it as it went from bush to bush apparently with no nest yet started. Suddenly the second bird (♂) copulated with the first (♀), the nest material still held in the mouth. A third bird appeared and a chase of all three ensued, but which remained the aggressor was undetermined.

June 3, 1937 Barley Camp, Warner Mts., Oregon - This species is still present though this location is several thousand feet higher than the 20-mi Cr. camp. Their distribution is still restricted, however to the *Artemisia* (still common though somewhat dwarfed) - typically to extensive sagebrush areas and rarely where conifers or aspens intermingle much with sagebrush.

Richardson 1937

Catalogue

9 mi. S Adel, mouth 20 mi. Creek, Lake Co., Oregon May 23, 1937.

✓ 51	♂	<i>Aphelocoma californica</i> sp.	96.5 g.
✓ 52	♂	<i>Aphelocoma californica</i> sp.	92.5 g.
✓ 53	♂	<i>Hedymeles melanocapillus</i> sp.	46.5 g.
✓ 54	♂	<i>Empidonax</i> sp. Testes 6 mm.	12.5 g.
✓ 55	♀	<i>Empidonax cyanocephalus</i> sp. large broad patch	62.5 g.
May 26, 1937 ✓ 56	♀	Golden-mantled Ground Squirrel	203.5 g.

280-98-22-39 no embryos

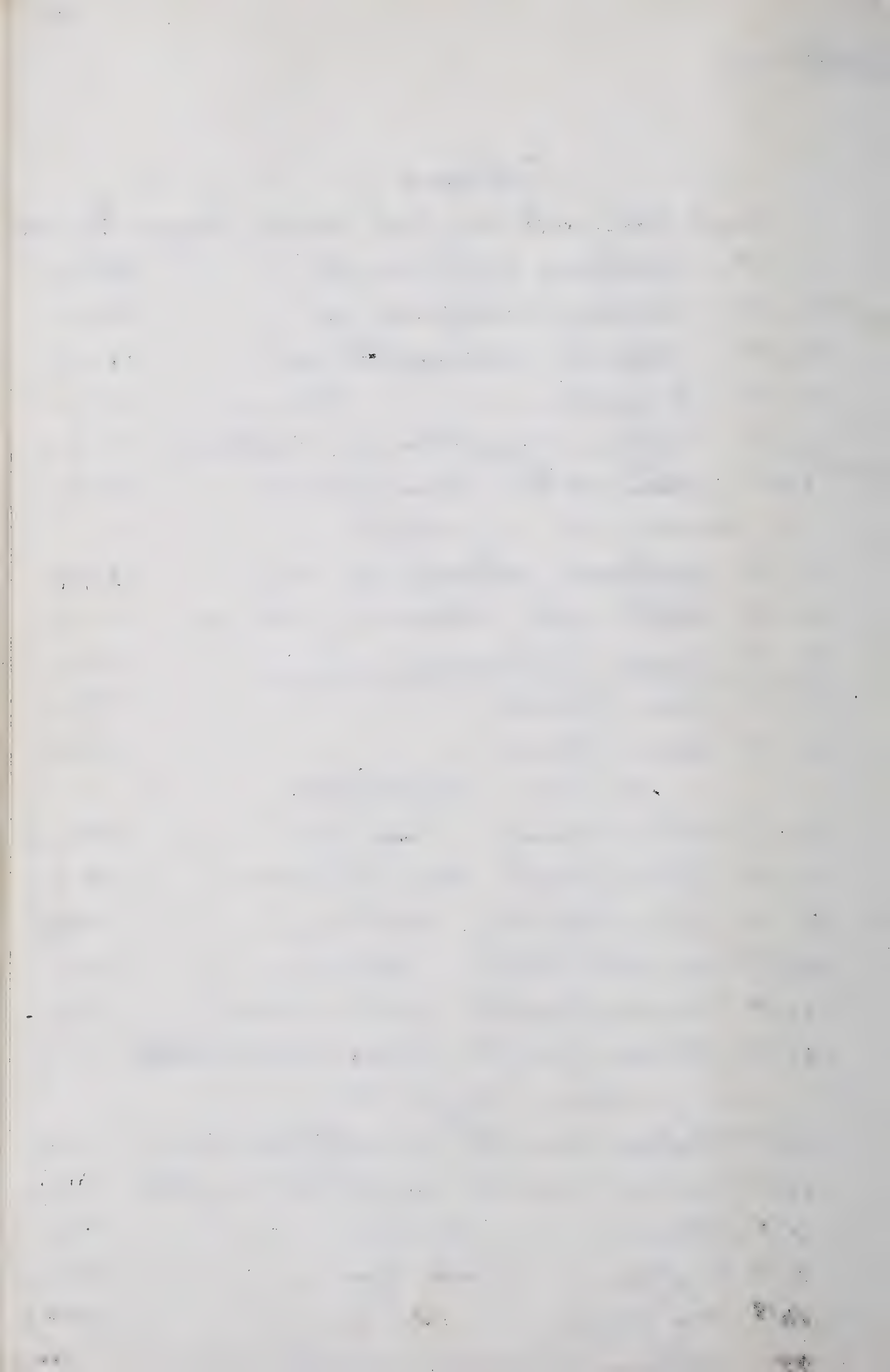
✓ 57	♂	<i>Aphelocoma californica</i> sp. Testes 9 mm.	97.5 g.
✓ 58	♂	<i>Colaptes cafer collaris</i> (?) Testes 13 mm.	157 g.
✓ 59	♀	<i>Psaranga ludoviciana</i>	34.5 g.
[Sent on permanent deposit to Helsingfors Mus., Finland]			
✓ 60	♀	Brewer Sparrow	10.3 g.
✓ 61	♂	Brewer Sparrow	10.0 g.

as above May 27, 1937

✓ 62	♂	California Quail Testes 13 mm.	149.5 g.
✓ 63	♀	California Quail Egg in duct 4:20 A.M.	188 g.
✓ 64	♀	Chipping Sparrow Small ovary	11.5 g.
✓ 65	♂	Long-tailed Chat Testes 9 mm.	23 g.
✓ 66	♂	Phainopepla Bush-tit Dark iris, Testes 5 mm.	6 g.
✓ 67	♀	Phainopepla Bush-tit yellow iris, large broad patch	5.5 g.

as above May 28, 1937

✓ 68	♂	Phainopepla Bush-tit Inner iris light brown, Testes 4 mm.	6.3 g.
✓ 69	♀	Phainopepla Bush-tit large broad patch, Iris yellow	6.5 g.
✓ 70	♂	Towhee Testes 6 mm.	17.4 g.
✓ 71	♂	Song Sparrow Testes 10 mm.	22 g.
✓ 72	♀	Song Sparrow	20 g.
✓ 73		<i>Sceloporus</i> (From West ridge of 20 mi. Cr.)	



F. Richardson 1937

Catalogue cont.9 mi S Adel, north 20-mi Cr., Lake Co., Oregon May 28, 1937 cont.

- 74 Brewer Sparrow (alcoholic) 10.4 g.
 75 Brewer Sparrow (alcoholic) 11.2 g.
 ✓ 76 ♂ *Petrochelidon lunifrons* oop. Testes 9 mm. 23.2 g.

as above May 29, 1937

- ✓ 77 ♂ Nevada Cowbird Testes 8.5 mm. 47.6 g.
 ✓ 78 ♀ Nevada Cowbird Egg in duct 37.3 g.
 ✓ 79 ♂ Yellowthroat Testes 7.5 mm. 10.3 g.
 ✓ 80 ♂ *Colaptes cafer collaris* Testes 14 mm. 161.5 g.

Large brood patch

- ✓ 81 ♂ *Dendroica aestiva* Testes 7 mm. 8.5 g.
 ✓ 82 ♂ *Lophortyx vallicola* oop. 154.5 g.

as above May 30, 1937

sent on permanent deposit to Helsingfors Mus., Finland

- [83 ♀ Black-billed Magpie Large brood patch 152.3 g.
 ✓ 84 ♂ Red-winged Blackbird Testes 11 mm. 63.8 g.
 ✓ 85 ♂ Rough-winged Swallow Testes 8 mm. 14.6 g.
 [86 ~~*Tachycineta thalassina*~~ ~~*thalassina*~~ ~~*thalassina*~~ 15.9 g.

sent on permanent deposit to Helsingfors Mus., Finland

- [♀ *Iridoprocne bicolor* Egg in duct
 ✓ 87 ♂ Rough-winged Swallow Testes 6 mm. 12.5 g.
 ✓ 88 ♀ *Iridoprocne bicolor* 16.9 g.

As above May 31, 1937

- ✓ 89 ♂ *Empidonax cyanocephalus* oop. Testes 14 mm. 72.7 g.
 ✓ 90 ♂ Lark Sparrow Testes 13 mm. 28.6 g.
 ✓ 91 ♂ *Empidonax cyanocephalus* oop. Testes 13 mm. 67.8 g.
 ✓ 92 ♀ *Empidonax cyanocephalus* oop. Brood patch 57.5 g.
 ✓ 93 ♂ Lark Sparrow Testes 12 mm. 31.3 g.
 ✓ 94 ♂ *Lophortyx vallicola* 159.6 g.

F. Richardson 1937

Catalogue cont.

9 mi. S Adel, mouth 20-mile Cr., Lake Co., Oregon - May 31, 1937 cont.

✓ 95 ♂ *Lophortyx californicus* 147 g.

9 mi. S Adel, E of mouth 20 mi. Cr., Lake Co., Oregon June 1, 1937

96 ♂ *Dipodomys ordii* ssp. 46.8 g.

240 - 140 - 41 - 14

97 ♀ *Peromyscus maniculatus* ssp. 32.6 g.

152 - 70 - 20 - 20 7 embryos 19 mm.

98 ♀ *Perognathus parvus* 22.9 g.

175 - 89 - 23 - 9

99 ♀ *Peromyscus maniculatus* ssp. 31.0 g.

161 - 71 - 20 - 24 6 embryos 3 mm.

Barley Camp, Warner Mts., 14 mi. SW Adel, Lake Co., Oregon June 2, 1937

✓ 100 ♂ Fox Sparrow Testes 10 mm. 28.1 g.

✓ 101 ♂ *Ocheloteria chlorura* Testes 12 mm. 29.4 g.✓ 102 ♀ *Colaptes cafer* 168.3 g.103 *Asyndesmus lewis* (alcoholic) 95.2 g.104 *Sitta carolinensis* (alcoholic) 15.5 g.105 ♂ *Ocheloteria chlorura* Testes 12 mm. 30.1 g.

106 ♂ Douglas Squirrel 325 - 135 - 53 - 25 278.3 g.

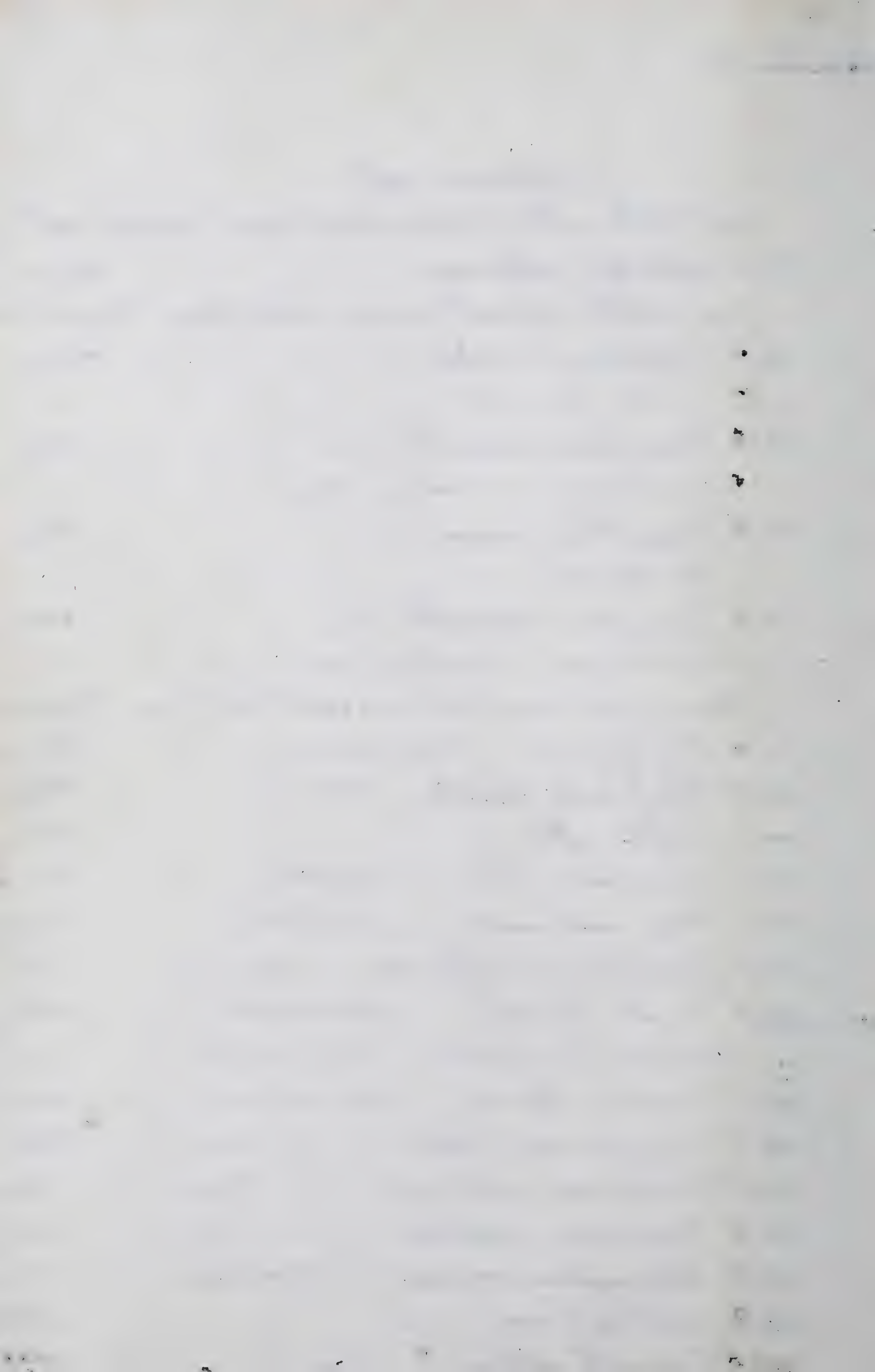
As above (June 2, 1937) June 3, 1937

107 ♂ Douglas Squirrel 284 - 125 - 52 - 27 111.6 g.

✓ 108 ♂ *Asyndesmus lewis* Testes 9 mm. 95.5 g.✓ 109 ♂ *Dendroica auduboni* Testes 8 mm. 13.3 g.✓ 110 ♂ *Dendroica auduboni* Testes 10 mm. 12.6 g.✓ 111 ♂ *Sphyrapicus varius* - Testes 7.5 mm. 45.1 g.

✓ 112 ♀ Warbling Vireo 11.5 g.

✓ 113 ♂ *Cyanocitta stelleri* Testes 10 mm. 121. g.



F. Richardson 1937

Catalogue (cont.)

Barley Camp, Warner Mts., 14 mi. SW Adel, Lake Co., Oregon June 4, 1937

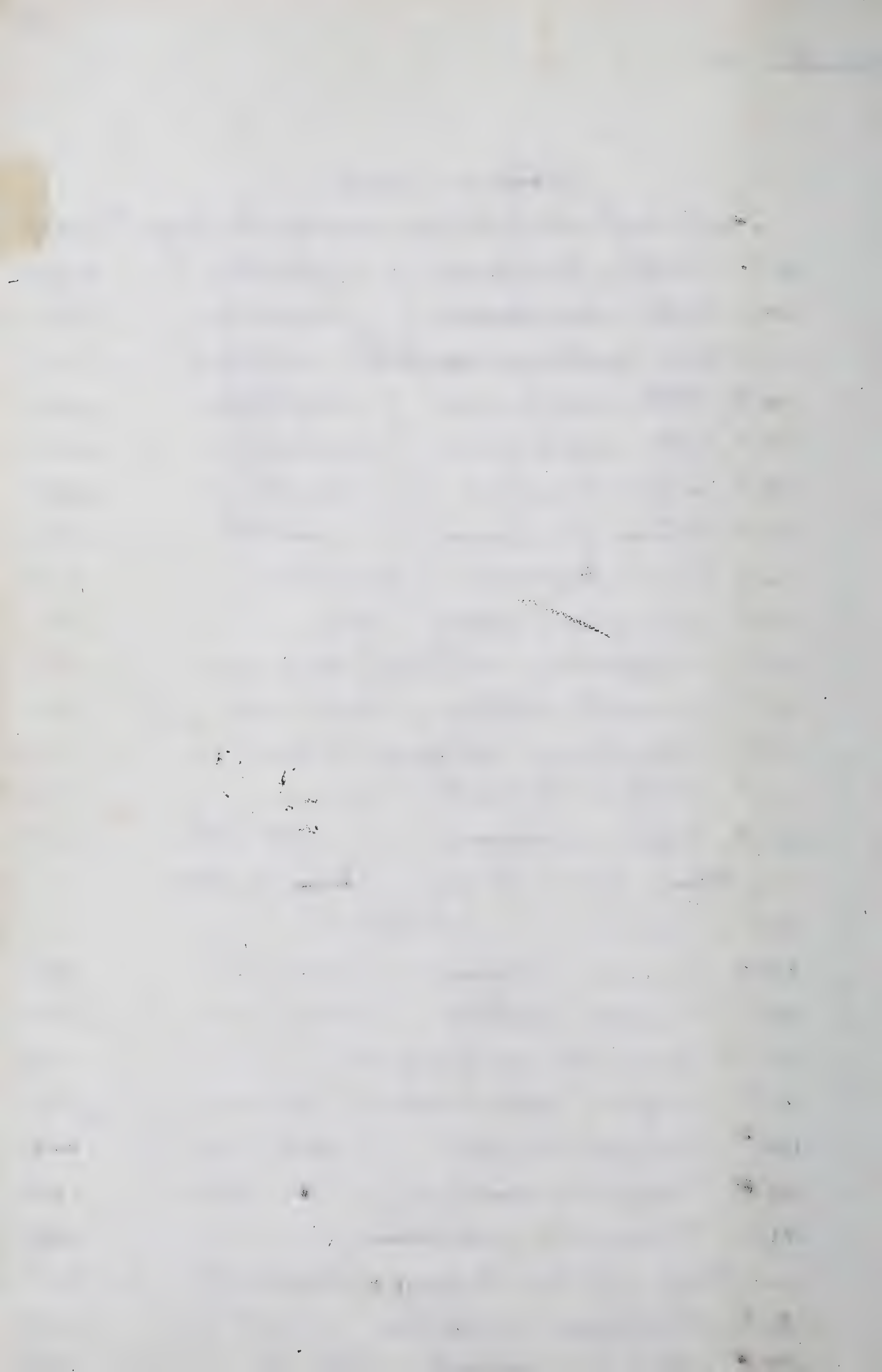
114		<i>Artelia familiaris</i> sp.	(alcoholic)	8.7 g.
115		<i>Sitta canadensis</i>	(alcoholic)	9.4
✓ 116	♂	<i>Sitta carolinensis</i> (sculptata)	(skeleton)	16.5
✓ 117	♀	<i>Sitta carolinensis</i>	(skeleton)	15.2
✓ 118	♂	<i>Sitta carolinensis</i>	(skeleton)	16
✓ 119	♂	<i>Artelia familiaris</i>	(skeleton)	7.5
✓ 120	♀	<i>Artelia familiaris</i>	(skeleton)	7.9
✓ 121	♀	<i>Falco sparveria</i>	Egg in duct	124.6
✓ 122	♀	<i>Sphyrapicus varius</i>	Laying	55.
✓ 123	♂	<i>Ochroboceria chlorura</i>	Testes 13 mm.	31.6
✓ 124	♂	<i>Cyanocitta stelleri</i>	Testes 10 mm.	115.6
✓ 125	♂	<i>Ochroboceria chlorura</i>	Testes 11 mm.	27.9
✓ 126	♂	Nuttall Poorwill		45.3
✓ 127	♀	<i>Sitta carolinensis</i>	(skeleton)	16.8

Plush, Lake Co., Oregon June 6, 1937

128		<i>Crotalus</i>	(alcoholic)	
✓ 129	♂	<i>Tyrannus tyrannus</i>	Testes 13 mm.	42
✓ 130	♂	<i>Melospiza melodia</i>	Testes 11 mm.	22.1
✓ 131	♀	<i>Passerculus sandwichensis</i>		17.5
✓ 132	♂	<i>Colaptes cafer collaris</i>	Testes 11 mm.	151.3
✓ 133	♂	<i>Melospiza melodia</i>	Testes 10 mm.	20.2
✓ 134	♂	<i>Passerculus sandwichensis</i>	Testes 10 mm.	17.2
✓ 135	♀	<i>Passerculus sandwichensis</i>		16.1

Plush, Lake Co., Oregon June 7, 1937

✓ 136	♀	<i>Melospiza melodia</i>	Laying	23.6
✓ 137	♂	<i>Melospiza melodia</i>	Testes 9 mm.	20.3



Catalogue (cont.)

Plush, Lake Co., Oregon

June 7, 1937 (cont.)

- ✓ 138 ♂ *Dendroica aestiva* Testes 9 mm. 8.9
 ✓ 139 ♂ *Dendroica aestiva* Testes 5 mm. 9

7 mi. N Plush, Lake Co., Oregon

June 8, 1937

- ✓ 140 ♂ Horned Lark Testes 9 mm. 29.9
 ✓ 141 ♀ Horned Lark Laying 31.8
 ✓ 142 ♂ Horned Lark Testes 10 mm. 29.4

N base Cook Pk., Warner Mts., Lake Co., Oregon

June 9, 1937

- ✓ 143 ♀ *Empidonax wrighti* 11.2

June 10, 1937

- ✓ 144 ♂ *Junco oreganus* Testes 9 mm. 18.9
 ✓ 145 ♀ *Oerholseria chlorura* 25.5
 ✓ 146 ♀ *Cyanocitta stelleri* 100.
 ✓ 147 ♂ *Hylocichla guttata* Testes 9.5 mm. 22
 ✓ 148 ♀ *Junco oreganus* 17.7
 ✓ 149 ♂ *Cyanocitta stelleri* Testes 7.5 mm. 115.3
 ✓ 150 ♂ *Certhia familiaris* (skeleton) 7.5
 ✓ 151 ♂ *Picoides arcticus* Testes 6 mm. 70.5

45

June 11, 1937

24.2

- ✓ 152 ♂ *Hylocichla guttata* Testes 11 mm. 24.2
 ✓ 153 ♂ *Oerholseria chlorura* Testes 11 mm. 29.6
 ✓ 154 ♂ *Oerholseria chlorura* Testes 11 mm. 30.6
 ✓ 155 ♂ *Oerholseria chlorura* Testes 10 mm. 29.9
 ✓ 156 *Sitta canadensis* (skeleton) 10.9
 ✓ 157 *Sitta canadensis* (skeleton) 10.5
 ✓ 158 ♂ *Sitta pygmaea* (skeleton) 9.3
 ✓ 159 ♂ *Sitta carolinensis* (skeleton) 16.5

F. T. Richardson 1937

Catalogue (cont.)

N. base Crook Mts., Warner Mts., Lake Co., Oregon June 11, 1937 (cont.)

✓ 160 ♂ *Hyla* *regilla* Testes 10 mm. 24.5 g.✓ 161 ♀ *Aotus* *atricapillus* (skin + skeleton) 1040.East Lake, ^{Paulina} ~~Deschutes~~ Mts., Deschutes Co., Oregon June 13, 1937162 *Hyla* *regilla* (alcoholic)163 *Hyla* *regilla* "164 *Hyla* *regilla* "165 *Hyla* *regilla* "166 *Hyla* *regilla* "167 *Hyla* *regilla* "168 *Bufo* "

1 mi. S East Lake, Paulina Mts., Deschutes Co., Oregon June 13, 1937

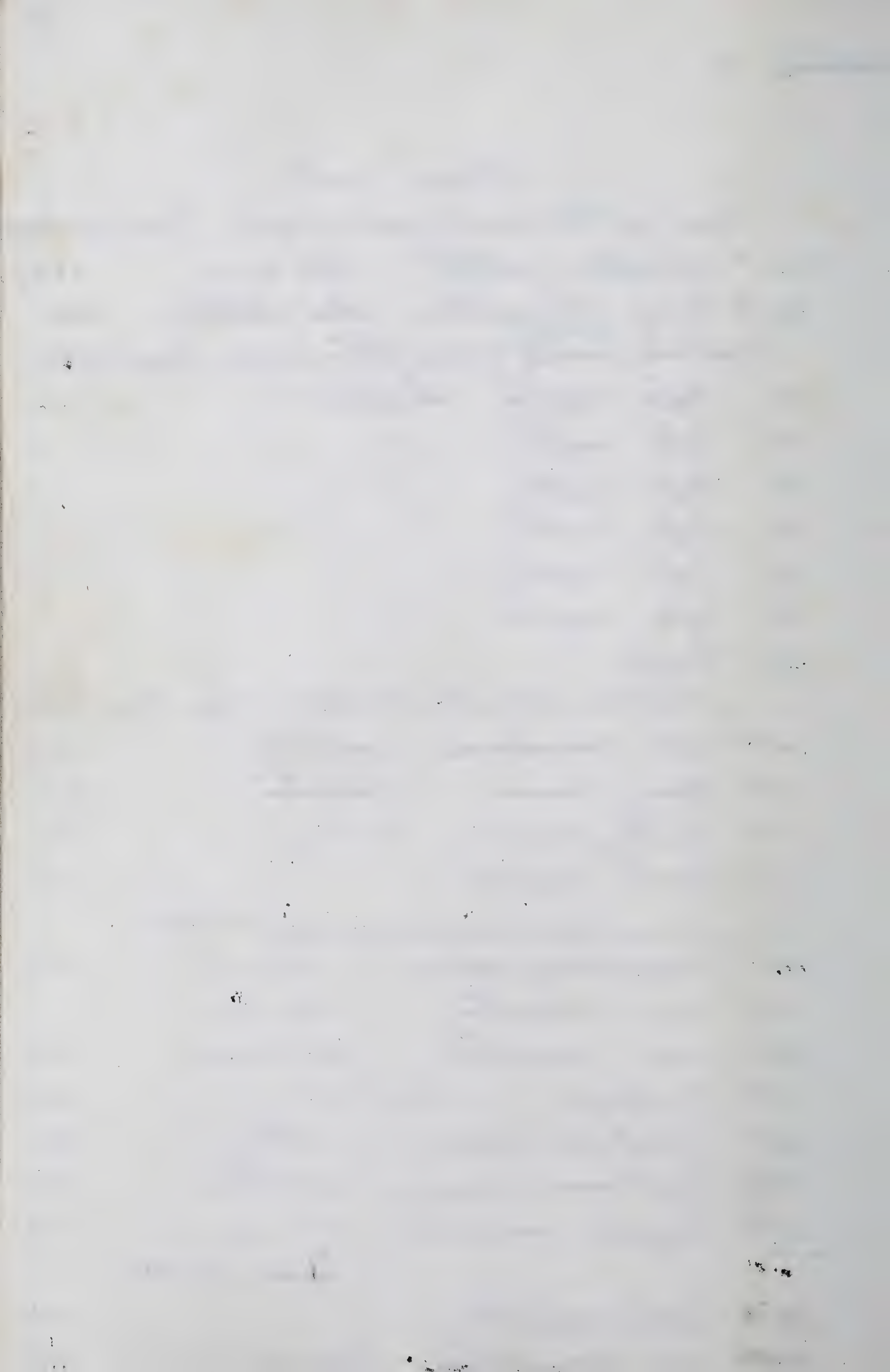
✓ 169 ♂ *Sitta* *canadensis* (skeleton) 10.7✓ 170 ♂ *Spinus* *pinus* (skeleton) 13.7✓ 171 ♂ *Spizella* *passerina* Testes 8 mm. 12.2✓ 172 ♂ *Spizella* *passerina* 11.5

sent on permanent deposit to Helsingfors Mus., Finland June 14, 1937

[173 ♂ *Carpodacus* *cassini* Testes 9 mm. 27.2✓ 174 ♂ *Loxia* *curvirostra* Testes 2 mm✓ 175 ♂ *Loxia* *curvirostra* Testes 1.5 mm 31.2176 ♂ *Eutamias* 188-75-31-17 51.3✓ 177 ♂ *Carpodacus* *cassini* (skeleton) 27.1✓ 178 ♀ *Carpodacus* *cassini* (skeleton) 29.5✓ 179 ♂ *Regulus* *calendula* Testes 5 mm. 6.3

June 15, 1937

✓ 180 ♀ *Loxia* *curvirostra* 30.4✓ 181 ♂ *Loxia* *curvirostra* Testes 1 mm. 34.2



F. Richardson 1937

Catalogue (cont.)

1 mi. S East Lake, Paulina Mts., Deschutes Co., Oregon June 15, 1937 Cont.

✓ 182 ♀ *Loxia curvirostra* 31.9 g.✓ 183 ♂ *Spizella passerina* Testes 6 mm. 11.9✓ 184 *Spizella passerina* 13

3 mi. W Paulina Lake, Deschutes Co., Oregon June 16, 1937

✓ 185 ♂ *Hylocichla guttata* Testes 9 mm.✓ 186 ♂ *Junco oreganus* Testes 8 mm. 16.5

June 17, 1937

✓ 187 ♀ *Dryobates villosus* 65.5188 ♀ *Eutamias* 184-74-31-18 45.1✓ 189 ♂ *Hylocichla guttata* Testes 12 mm 23.7✓ 190 ♂ *Vireo olivaceus* Testes 6 mm. 13.8✓ 191 ♀ *Dendroica auduboni* 12✓ 192 ♂ *Sitta canadensis* (skeleton) 9.2✓ 193 ♀ *Sitta canadensis* (skeleton) 8.7194 *Sitta canadensis* (alcoholic) 9.3195 *Corthia familiaris* (alcoholic) 7.3✓ 196 ♂ *Dendroica auduboni* Testes 7 mm. 12.4✓ 197 ♀ *Dendroica auduboni* 11.5

June 18, 1937

✓ 198 ♀ *Dendroica auduboni* Laying 14.1✓ 199 ♂ *Glaucoideus griseus* Testes 6 mm. 71.8✓ 200 ♂ *Corthia familiaris* Testes 7 mm. 7.2

June 19, 1937

✓ 201 ♂ *Regulus calendula* Testes 5 mm. 6.2✓ 202 ♀ *Hylocichla guttata* Laying 28.✓ 203 ♂ *Hylocichla guttata* Testes 10 mm. 26.7

F. T. Richardson 1937

Catalogue (cont.)

3 mi. W Paulina Lake, elev. 5700', Deschutes Co., Oregon June 19, 1937 (cont.)

204	<i>Sitta canadensis</i>	(alcoholic)	11.9
✓ 205 ♂	<i>Junco oreganus</i>	Testa 10 mm.	16.8
✓ 206 ♂	<i>Sitta canadensis</i>	(skeleton)	10.4
✓ 207 ♀	<i>Sitta canadensis</i>	(skeleton)	11.1
✓ 208 ♀	<i>Penthestes gambeli</i>	(skeleton)	10.8

June 20, 1937

✓ 209 ♂	<i>Sphyrapicus thyroideus</i>	Testa 8 mm.	57.8
✓ 210 ♂	<i>Dryobates villosus</i>	Testa 5 mm.	73.2
211 ♂	<i>Sitta canadensis</i>	(skeleton)	11.2
212 ♂	<i>Sitta canadensis</i>	(skeleton)	10.9
✓ 213 ♂	<i>Certhia familiaris</i>	(skeleton)	8.2
214	<i>Certhia familiaris</i>	(alcoholic)	8.3

June 21, 1937

215 ♂	<i>Peromyscus maniculatus</i>	141-66-19-17	11.9
216 ♂	<i>Peromyscus maniculatus</i>	146-66-20-17	19.
217 ♂	<i>Peromyscus maniculatus</i>	(unskinnable)	19.7
217 ♂	<i>Peromyscus maniculatus</i>	153-73-20-18	18.
218 ♂	<i>Eutamias</i>	184-72-31-18	43.8
219 ♂	<i>Eutamias</i>	184-78-30-17	41.6
✓ 220 ♂	<i>Passercella iliaca</i>	Testa 8 mm.	27.3
✓ 221 ♂	<i>Ochrolauria chlorura</i>	Testa 15 mm.	27.3

June 22, 1937

✓ 222 ♂	<i>Sitta canadensis</i>	(skeleton)	10.2
4 mi. N Redding, Calif. June 23, 1937.			
223	<i>Sitta carolinensis aculeata</i>	(skeleton)	16.7
✓ 224	<i>Sitta carolinensis aculeata</i>	(skeleton)	16.9

